

The claimed invention is directed to a process for improving the impact performance of a thermoplastic molding composition. Accordingly, mixing polycarbonate with nano-sized clay and carboxylic acid in specified relative amounts, results in the improvement.

The claimed nano-sized clay has platelet thickness (average) of 1 to 100 nanometers (nm) and length and width, independently one of the other (average) of 50 to 700 nm.

The improvement in impact performance is measured in relation to a corresponding composition that contains no carboxylic acid.

Claims 13-15 and 20-23 stand rejected under 35 U.S.C. 102(e) as anticipated by U.S. Patent 6,610,770 to Ross et al ("Ross") with U.S. Patent 5,178,730 to Bixler et al ("Bixler"), U.S. Patent 6,858,665 to Larson ("Larson") and U.S. Patent 7,025,023 to Masuda et al (herein Masuda).

Ross disclosed a flame retardant polymer prepared by incorporating organoclay in a polymer. The organoclay is "a reaction product obtained by the intercalation and reaction of (a) one or more smectite clays; (b) one or more quaternary ammonium compounds and/or (c) one or more organic materials" (column 5, lines 46 et seq.). Examiner has recognized that Ross "do not mention the particle size of ht (sic.) clay" (Office Action page 2, paragraph 3).

Each of Bixler, Larson and Masuda disclosed certain clay products and their respective thickness, length and/or width nano-sized dimensions. These documents have been presented by Examiner for "proving that the particle size is inherent in the nanoclay" (sic.).

While it is axiomatic that nano-sized particles are inherent in nanoclay, nothing in Examiner's "proof" supports the notion that Ross' clay is nano-sized, much less that Ross' clay exhibits the claimed particle dimensions.

As Examiner is certain to know, not all clays are nano-sized and not all nano-sized clays exhibit the dimensions of the presently claimed particles. Suffice it to say that clay particles range widely in size and particles as large as 707 microns (=707000 nanometers) have been disclosed in U.S. Patent 5,495,989 (column 1, line 55).

Examiner's "proof" has no bearing in the present context.

The rejection under section 102(e) is untenable and its retraction is urged.

Claims 13-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ross in view of Bixler or Larson. This rejection is respectfully traversed.

Ross disclosed a flame retardant polymer prepared by incorporating organoclay in a polymer.

The polymer, that may be thermoplastic or thermosetting (column 4, line 56). The thermoplastic polymers are virtually limitless and include polyolefins, polyamides, polyphenylene ether, and polyamide-imide copolymers, polyesters, polycarbonate, polyether-imide, polyether-ether-ketone, polyphenylene sulfide, and polyimides, polystyrene and copolymers such as ABS, SAN, ASA, styrene-butadiene, sulfone based resins, elastomers (including olefinic, polyurethane, and styrenic TPE) and chlorinated polymers (column 5, line 13 et seq.).

The organoclay is (per column 5, lines 46 et seq.) "a reaction product obtained by the intercalation and reaction of (a) one or more smectite clays; (b) one or more quaternary ammonium compounds and/or (c) one or more organic materials" (emphasis added).

Ross' optional<sup>1</sup> organic material - component (c) - includes acidic functional organic compounds (column 8, lines 47 to column 9, line 50) and non-ionic materials (column 9, line 51 to column 10, line 25). The acidic functional organic compounds include carboxylic acids (column 8, lines 63 et seq.) and organic sulfuric acids (column 9, lines 27 et seq.), organo-phosphorous acids (column 9, line 40) phenols (column 9, line 44), thioacids (column 9, line 46), and aminoacids (column 9, line 47).

Bixler disclosed nano-sized clay in the context of a process for making paper.

Larson disclosed using nano-sized clay in a process for preparing a rubber composition.

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<sup>1</sup> See column 4, line 8, column 5, line 48 and column 8, line 47 where the organic material (c) is described as an optional component.

The claimed invention is directed to a process for improving the impact performance of a polycarbonate – containing thermoplastic composition; the process entailing mixing polycarbonate with nano-sized clay and carboxylic acid.

Even if Ross would be properly combined with any of the secondary references, it is not immediately clear why Ross that concerns flame retarding technology and is completely silent relative to impact performance may reasonably be seen as rendering obvious the present invention that relates to improved impact performance.

Applicants submit that Ross' shortcomings in the present context are not at all cured by Bixler or Larson and that the prima facie case of obviousness has not been made.

Moreover, for arriving at the present invention starting from Ross, the art-skilled would need to

- (i) Select polycarbonate from among the virtually limitless genus of disclosed “thermoset or thermoplastic polymers” (column 4, line 57), and
- (ii) Avoid the specifically named SAN (column 5, line 31), and
- (iii) Elect to use the organic material, Ross' optional component (c), and
- (iv) Select carboxylic acid from among the large number of component (c) alternatives.

In respect to (i) and (ii), Applicants have in prosecution provided evidence pointing to that the inventive process is not applicable to SAN<sup>2</sup>.

In respect to (iii), Applicants experimental data included in the application demonstrate, the criticality of using in the inventive process, Ross' optional component.

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<sup>2</sup>- Examiner is clearly in error in faulting Chung's Declaration (submitted June 15, 2007) that evidences the inapplicability of the presently claimed process to SAN. Examiner asserts (Office Action, paragraph 7) that

“the substitution of polycarbonate with SAN is not a selection between equivalents”. Applicants call attention to that SAN and polycarbonate are members of the group of polymers suitable in Ross' invention (see column 5, line 31 and line 28, respectively). Nothing in Ross suggests that these members are anything but equivalents one to the other in Ross' context.

Clearly, in the absence of direction to select among the myriad of possibilities presented by the cited art, the claimed invention cannot reasonably be viewed as obvious. The rejection alleging obviousness is clearly unfounded and its retraction is respectfully solicited.

Believing the above represents a complete response to the Office Action and that the application is in condition for allowance, Applicants request the earliest issuance of an indication to this effect.

Respectfully submitted,

By



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